a fiord 500 feet deep, thus making a discordance of 1,250 feet between trunk and branch ice-channels. Although the coast exhibits a very large proportion of bare rock, moraines of well-preserved form are found here and there. The limit of post-glacial sea-action is about 575 feet above present sea-level at St. John's and declines northwestward somewhat irregularly to 250 feet at the furthest point reached. Within the wave-washed slope boulders are rare; sea-cut and sea-built shore lines are common.

A narrative of the expedition is given by Delabarre (*Bull. Geogr. Soc. Phila.*, III., 1902, 65–212).

PHYSICAL GEOGRAPHY OF NEW YORK.

THE series of articles contributed by Tarr to the *Bulletin of the American Geographical Society* is now published in book form—'The Physical Geography of New York State'—with a chapter on Climate by Turner (Macmillan, 1902, 397 pp., many figures and maps). It makes by far the most compendious treatise yet devoted to the physiography of the Empire State, and must prove of great service to students there and elsewhere from its interesting style, its abundance of illustration (some of the half-tone cuts are, however, blurred to the point of being useless defacements of the pages), and its plentiful reference to sources. Yet the book is disappointing, in so far as it shows that regional physiography is still an undeveloped subject, uncertain of its limits, relatively unsystematized and undisciplinary in its methods, and not clearly guided in its presentation by a thoroughly developed scheme of systematic geography. To Tarr, nevertheless, belongs the merit of actually accomplishing an important piece of work according to his best plan available for it, while other physiographers seem to hesitate to begin such tasks because they do not see clearly through them to the end.

NEW MAP OF SWITZERLAND.

THE Federal Topographical Bureau at Bern has recently published a four-sheet wall map of Switzerland on a scale of 1:200,000, in which the illusion of actual relief is most effectively produced. The original map was colored by Künemerly, artist-lithographer of Bern. It subdues the lowlands in a cool gray tint, and brings out the mountains as if lighted from the northwest by a midsummer sunset; the illuminated slopes being white or rose, the shaded slopes blue or purple. The area includes reaches from the southern Vosges and Schwarzwald to the northern border of the plains of Lombardy, and takes in the whole of the Jura on the west and part of the Tyrolese Alps on the east. Boundaries and the larger towns and cities are in red, water in blue, roads and names in black. Contours are drawn for every one hundred meters. The map is an exceptionally fine piece of work and should come into general use in the study of the Swiss Alps.

W. M. DAVIS.

SCIENTIFIC NOTES AND NEWS.

THE committee of the House on Buildings and Grounds has reported favorably the bill, which has passed the Senate, carrying $2,500,000 for the construction of a new building for the Department of Agriculture, but reduced the limit of cost to $1,500,000.

DR. W. A. SETCHELL, professor of botany at the University of California, has been given leave of absence for the next academic year.

MRS. M. C. STEVENSON has returned to Washington from ethnological investigations at Zuñi.

AT New York University Professor Carl C. Thomas, head of the department of marine engineering, has resigned to devote his time exclusively to professional work on the Pacific Coast.

DR. ROSE BRADFORD has resigned the post, which he has held since 1896, of professor-superintendent of the Brown Animal Sanitary Institution, London.

MESSRS. SIEMENS and Halske, Berlin, have acquired the European patents of the system of long distance telegraphy, discovered by Professor Michel Pupin, of Columbia University.

DR. ANDREW BALFOUR, of Edinburgh, is going out as director of the chemical and phys-

iological laboratories at the Gordon Memorial College, Khartoum. These laboratories are equipped with the most modern appliances, and are the gift of Mr. H. S. Welcome, who recently visited the Soudan.

MR. JONATHAN HUTCHINSON, F.R.S., is about to start for a tour in Ceylon and India, hoping to confirm his hypothesis that the consumption of badly-cured fish is the cause of leprosy.

THE death is announced of Mrs. Alice Freeman Palmer, formerly president of Wellesley College. After her marriage to Professor Palmer, of Harvard University, she continued to take an active interest in educational matters.

MR. LUDWIG KUMLIEN, who was naturalist of the Howgate Polar expedition in 1877, and was afterward connected with the Smithsonian Institution and the Fish Commission, has died at his home in Milton, Wisconsin.

THE directors of the Ben Nevis observatories have obtained funds to keep the observatories open until October, 1904.

THE New York *Evening Post* states that an important meeting of the New York State Electrical Laboratory Commission was held in New York on Monday, December 8. There were present State Engineer Bond; Harold W. Buck, of Niagara Falls; C. P. Steinmetz, of New York city, and State Architect Hines. Plans already submitted to the commission were approved, and Messrs. Buck and Steinmetz reported on the amount of space needed for the electrical apparatus. The cost of the proposed buildings and equipment will be between $250,000 and $300,000. The buildings alone will cost in the neighborhood of $100,000. The commission decided to make a preliminary draft of its report to be presented to the legislature at the next session of that body.

THE Carnegie Institution has made a grant of $500 to Professor Bancroft, of Cornell University, for a systematic study of the bronzes. The work will be similar to that recently published on the alloys of bismuth, lead and tin, and will consist primarily in the analytical determination of the solid phases.

THE medical papers report that the Carnegie Institution has made an annual grant of $10,000 to revive the *Index Medicus,* formerly published under the direction of Dr. John S. Billings. The New York *Evening Post* states that the institution has made a grant of $1,000 to the astronomical department of Vassar College to enable Dr. Caroline E. Furness to make measurements and reductions of photographs of the stars in the region of the North Pole.

A BILL has been passed by the House of Representatives for the incorporation of a 'general educational board' the incorporators named in the act being the following well-known educators: Daniel C. Gilman, George Foster Peabody, Morris K. Jesup, Robert C. Ogden, William H. Baldwin, Jr., Jabez L. M. Curry, Frederick T. Gates, Walter Page and Albert Shaw. This is a movement for advancing education in the south, in which Mr. John D. Rockefeller and others have taken an interest. The scope of the board is, however, very broad, being described as follows: "To build, improve, enlarge, or equip buildings for elementary or primary, industrial, technical, normal or training schools for teachers, or schools of any grade, or for higher institutions of learning, or, in connection therewith, libraries, workshops, gardens, kitchens, or other educational accessories; to establish, maintain, or endow such schools; to employ or aid others to employ teachers and lecturers; to aid, cooperate with or endow associations or other corporations engaged in educational work within the United States; to collect educational statistics and information and to publish and distribute documents and reports containing the same."

IT is stated in the London *Times* that the royal commission on arsenical poisoning has recently held a series of meetings in connection with a report received from their Assistant Commissioner, Mr. H. Hammond Smith, on the liability of articles of food and drink other than beer to contain arsenic, and have taken evidence from certain manufacturers on this part of their reference. Several chemical and other inquiries which the

commission have instituted are also in progress. It is understood that the commission will complete taking evidence early in the next parliamentary session, and will then prepare their final report.

On December 6, at the Randal Morgan Physical Laboratory of the University of Pennsylvania, a physical club was organized under the name of the Kelvin Physical Club for the encouragement of research and scientific reviews in the department. Professor Arthur W. Goodspeed was elected president, Dr. Horace C. Richards, vice-president and Dr. Joseph H. Hart, secretary.

The American Society of Mechanical Engineers held its forty-sixth meeting in New York City, December 2 to 5.

At a meeting of the Royal Society of Edinburgh on December 1, Lord Kelvin presiding, Professor J. Cossar Ewart read a paper on a new horse from the Western Islands. According to the report in the London *Times* he said that until quite recently it was quite commonly assumed that all living horses belonged to one and the same species. It had also been generally assumed that various breeds of European horses had been descended from domestic varieties originally from the East. Since numerous etchings had been discovered on the walls of caves the belief was no longer so universal that the horse had not been domesticated in Europe before the arrival of Neolithic man. After pointing out the difference between horses and zebras and donkeys in that zebras and donkeys had no callosities, Professor Ewart proceeded to describe the Przevalsky horse, and next the new variety which had recently been discovered. This was a pony, not the dwarf horse that took the place in the West which the Arab took in the East with similar characteristics to the Arab, but having this essential difference, that there were no callosities in the hind legs, and instead of having long hairs right up to the root of the tail, it resembled the wild horse of Central Asia, the Przevalsky horse, in having short hairs in the upper part of the tail just as in mules. As the most typical specimen had been found in an out of the way part of Iceland there was no chance of its ever having been crossed with a Przevalsky horse; it was exactly of the same color as the wild horse of Central Asia. Not having callosities, it agreed with the asses and zebras, and, like the asses and zebras, it was highly specialized in the size, form of the head, ears, and under lip, and the position of the eyes. The Celtic pony decidedly differed from the Przevalsky horse. The limbs were slender with small joints and narrow hoofs. The Celtic pony occurred in Iceland, the Faroë Islands, and Barra, and other smaller islands of the Outer Hebrides. It at one time seemed to have been common in the island of Tiree, in which ponies were now extinct. Doubtless it occurred in Ireland, a very typical example having recently been found in Connemara. There was evidence also that it occurred in the New Forest. On the other hand, there was no evidence that ponies of this kind were found anywhere in the East. Java, Mongolia, Korea and Kathiawar had all been examined, but all the ponies there had had the characteristics of the Arab horse. They had all callosities, well haired-up tails, and long pointed ears. It was conceivable that the Celtic pony in its present form never existed in the East, but that it was the modified descendant of a small horse which left the ancestral home in Central Asia and reached Europe long before the arrival of Neolithic man. There were drawings in caves which suggested the existence of a small horse that might very well correspond to the Celtic pony, and further, bones had been found of two kinds of horses, one a horse with small head, slender limbs, and small teeth, which, again, suggested the Celtic pony.

At the Society of Arts, London, on November 26, Dr. Gustave Goegg, professor of technology at the High School of Commerce, Geneva, read a paper on the Simplon Tunnel. According to the report in the London *Times*, he observed that the pass over the Simplon had been for centuries one of the routes from the valley of the Rhone to Lombardy, and after various schemes had been brought forward, the Jura-Simplon Company, who had

obtained a concession for making the line, agreed with a syndicate for its construction. There were to be two tunnels side by side. It was agreed that the work should begin at latest on November 13, 1898, and the first tunnel was to be completed, and the piercing of the second tunnel finished, in five years and a half—by May 15, 1904. The length of the tunnel was 19,770 meters. At the beginning hand-drilling gave a progress of 1.94 meters a day, but since hydraulic drills were set to work the progress made had been at the rate of seven, eight, and ten meters daily. Up to the end of last month 13,608 meters had been pierced. Owing to difficulites, the syndicate had requested that the date for the termination of the work might be extended for fourteen months—to July 1, 1905. There existed a desire for the construction of a French railway which might utilize the Simplon Tunnel, and repair the injury which the St. Gothard Tunnel had inflicted on French commerce. M. Bénassy-Philippe, president of the French Chamber of Commerce at Geneva, had taken the lead in the promotion of such a line, about 75 kilometers long, connecting Lons-le-Saulnier-Sainte Claude and Geneva, and crossing the Jura in the district known as La Faucille, thus saving three hours in the journey between Paris and Geneva and two hours on the St. Gothard line. The proposal for constructing such a railway met with great sympathy in Italy, as it was felt that such a line was just what was wanted to ensure the passage of much of the traffic to the east through the new tunnel. English commerce would flow through whichever tunnel was served by the shortest route, and this would eventually be by the La Faucille line and the Simplon Tunnel.

IN view of the great works for irrigation now being planned by the Geological Survey, the review of irrigation works for India recently published by the British government is of interest. According to the London *Times* the 'productive works'—that is, those constructed out of loan funds in the expectation that they would prove directly remunerative—yielded a net revenue of about £1,633,000, the largest on record, equivalent to a percentage of 7.36 on a total capital outlay of £22,172,000. This percentage has only once been exceeded—viz., in 1897–98, when it was 7.50. The most profitable results were obtained in the Punjab and Madras, where the percentages were 11.24 and 9.05 respectively. Out of 35 works classed as productive, 13 (including all the canals in Bengal, the Deccan and Gujarat) are never expected to cover the interest on the capital outlay. The 22 actually productive works yielded 10.11 per cent. One canal, the Cauvery delta in Madras, returned 34.81 per cent. If the total surplus profits realized up to the end of 1900–1901 be added together, the open canals have produced 27½ per cent., after paying all charges for interest and working expenses. No new productive works were opened in 1900–1901, but £612,000 was spent on seven new works in Upper Burma, the Punjab, and Sind. With regard to works constructed out of the famine grant as 'famine protective works' not expected to be remunerative, it is noteworthy that they yielded a return of 2.35 per cent. on capital. But this is largely due to the great and increasing success of the Swat River Canal, which alone yielded 10.41 per cent. Five more protective works are under construction. There is a large number of 'minor works,' which irrigated 2,625,456 acres in 1900–1901, and returned 7½ per cent. on capital. Those in Sind proved the most lucrative, yielding 26.18 per cent. Another class of 'minor works,' for which no capital accounts are kept because they were mostly constructed under native rule, irrigated 2,581,829 acres. Moreover, Madras Presidency has 28,000 tanks and 6,000 irrigation channels, irrigating 3,173,250 acres. The total area irrigated by all descriptions of works in 1900–1901 was 19,646,000 acres, the largest on record. The total capital outlay on works for which capital accounts are kept has been about £28,320,000, yielding in 1900–1901 about 6¾ per cent., after payment of interest, etc. The value of the crops raised on the irrigated area during the year was estimated at £27,667,000, or approximately the amount of the capital outlay. On

the whole irrigation has been profitable not only to the cultivator, but also to the general taxpayer, for up to the end of 1900–1901 the total gain to the State amounted to £11,250,000. The gain would have been much greater but for the expenditure in earlier days on some of the works expected to be remunerative.

The Paris Academy of Medicine dedicated on November 25 the new building provided for it by the government. The president of the republic was present and speeches were made by Dr. Riche, president of the academy; M. Chaumié, minister of education, and Dr. Jacoud.

UNIVERSITY AND EDUCATIONAL NEWS.

We noted recently that the University of California will begin at once the construction of a special laboratory of physiology for Dr. Jacques Loeb. It is now announced that the $425,000 lately given to the University will be used for the construction of a Hall of Physiology to be completely equipped with research laboratories, salt water aquaria, etc. Professor Loeb will begin his work at the University of California in January.

By the will of Benjamin Barge of Mauch Chunk, a bequest of $80,000 is made to Yale University, $75,000 of which is to establish a chair in the romance languages and literature. Lafayette College receives $2,500.

Mr. Morris K. Jesup, president of the American Museum of Natural History, has given $10,000 to Princeton University to be added to the fund that he has established for the benefit of the library.

Mr. William S. Hubbard, of Indianapolis, has promised to give the last $5,000 needed to purchase the United States Arsenal grounds in that city as a site for the National Technical Institute.

The library building, given to Trinity College, Durham, N. C., by Mr. James B. Duke, will be opened in January. The dormitory given by Mr. B. N. Duke, is already occupied. It will be remembered that last spring Mr. B. N. Duke established four new chairs at Trinity College, including a chair in applied mathematics, to which Mr. L. C. Nicholson has now been called.

The new buildings of Wooster University erected at a cost of over $400,000, were dedicated on December 11. It will be remembered that the buildings of the university were almost completely destroyed by fire about a year ago. The chief contributors to the new university buildings are Andrew Carnegie, $100,000; Louis H. Severance, Cleveland, $75,000, and H. C. Frick, Pittsburgh, $35,000.

In his last report, President Wheeler, of the University of California, stated that among the most urgent needs of the university were buildings for botany, physics and physiology.

Mr. G. W. Palmer, M.P., has given $1,000 towards the physiological laboratory of the University of London.

The delegates in attendance at the conference of the Association of American Universities to be held at Columbia University during convocation week will be entertained at a dinner on the evening of December 30. Alumni of the fourteen universities represented in the association are invited to subscribe to the dinner, the cost of which will be $5.00. Application for tickets may be made to the chairman of the committee, Professor D. B. Woodward, Columbia University.

At a recent meeting of the corporation of the Massachusetts Institute of Technology Mr. Elihu Thomson, of Lynn, was elected non-resident professor of applied electricity and Mr. Percival Lowell, director of the Lowell Observatory at Flagstaff, Ariz., non-resident professor of astronomy.

At McGill University, Dr. A. H. Gordon has been appointed demonstrator and Dr. H. W. Thomas fellow in pathology.

Professor Knight has resigned from the chair of moral philosophy at the University of St. Andrews, after having discharged the duties of the office for twenty-seven years.

Dr. W. A. Tilden, professor of chemistry in the University of London, has been elected dean of the faculty of science in the University of London.